

22ND ANNUAL



22ND LCI CONGRESS
OCTOBER 19-23

Target Value Delivery: Being Comfortable with Being Uncomfortable

Todd Lord, Penn State Health

Gregory Stackel, HKS, AIA

Roger Stadler, Barton Malow Builders

THE ABC'S OF LEAN: TRANSFORMATION THROUGH ACTIONS, BEST PRACTICES AND COACHING

October 23, 2020

The Presenters



TODD LORD

Sr. Vice President of
Community Hospital
Development
Penn State Health



GREGORY STACKEL

Principal
HKS



ROGER STADLER

Project Director
Barton Malow / Alexander

Out of the Comfort Zone

As a/an ____ would you be comfortable with ____

Owner

- Admitting you had a bad proforma budget
- Releasing work while the project is over-budget
- Making MEP operational decisions early before the staff is hired

Designer

- Committing to a budget with a critical design schedule – No Time to for Rework
- Providing a steel mill order package before the end of Schematic Design

Contractor

- Provide forum for trade partners to ‘call you out’

(Sub)Contractor

- Responding meaningfully, quickly, in real-time to design evolution

All: Trusting that the team will hit the dates and overcome the misses

The Challenge: Speed to Market

Meeting the Speed to Market Goal for New Community Hospitals

8 months from onboarding AE/CM to groundbreaking, 26 months of construction

Do it again, build more, at lower unit cost

FROM THIS

Stantec

PRELIMINARY PROJECT BUDGET

Penn State Health
Lancaster Site - 144 Bed Option
179801879
April 5, 2019

DRAFT

Category	Budget	Comments
Hospital Construction	\$190,166,500	319,000SF Hospital
MOB Construction	\$16,575,000	40,000SF MOB
Sitework	\$12,000,000	620 Surface Parking Spaces
Parking Garage	\$10,497,500	380 Parking Garage Spaces
CUP	\$17,500,000	22,000SF CUP
Other Construction	\$3,800,000	
Equipment & Furnishings	\$59,588,042	
IT Budget	\$24,007,958	
Professional Fees	\$19,740,000	
Reimbursables and Misc. Costs	\$2,813,000	
Miscellaneous Development Costs	\$500,000	
Project Contingency	\$21,590,000	
Financing & Interest	\$0	
TOTAL PROJECT BUDGET	\$378,778,000	

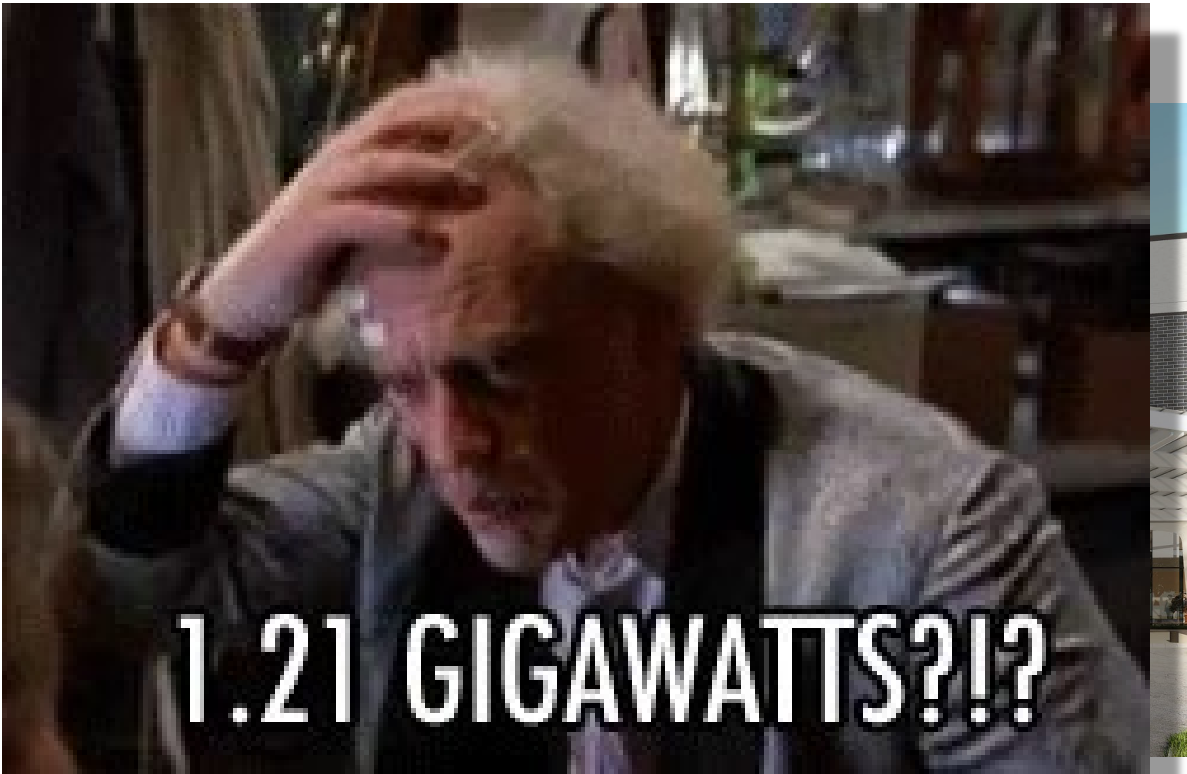
Notes and Clarifications:

The construction budget assumes [4.5%] escalation per year up to the mid-point of construction.
Construction start date is assumed in May of 2020 with a 30 month construction duration.
This is a draft budget based on a concept program not fully vetted by PSH
This assumes a preliminary benchmarked budget for medical equipment which will be refined with equipr
This assumes the preliminary budget for IT which will be refined with PSH IT Department
This assumes the preliminary budget for furniture which will be refined with the end users

At this time there are any costs associated with Care Connect have NOT been included

Assumes MOB construction to match I-2 construction

Hospital construction line item includes an allowance for a rooftop helipad



IN THIS



The Reason: Meet a Critical Need

Q WHY DO WE NEED THESE HOSPITALS FAST?

- Overall strategy 10/20/30 rule from Primary Care, Specialist, Hospital
- Lancaster – Closure of an existing hospital created a critical need for services



The Projects



HAMPDEN MEDICAL CENTER

- 300,000 sf ; 108 beds
- 1st Community Hospital for System
- **Owner's & Owner's Rep's 1st TVD Project**
- 26 Months Construction
- Deed Restrictions Limiting GSF

COMMON ATTRIBUTES

**Owner, CM,
Owner's Rep**

**CM/Design Team
Prior TVD
Experience**

IPD-Lite



LANCASTER MEDICAL CENTER

- 355,000 sf, 144 Beds
- 60,000 sf MOB
- 300 car Parking Garage
- **38% larger, same 26 Months**
- **Target Cost Reduction of 7%**

The Solution

TARGET VALUE DELIVERY

- Productive methodology if managed effectively
- Requires a different set of priorities and new work methods
 - Get the right information at the right time
 - Likely to make most uncomfortable the first time
- Create priorities given limited dollars and time
- Give more time to make smarter decisions with the process.
- Trust in the process – be uncomfortable



So how to run a TVD project?
What does it take?



“You use that word a lot, I do not think it means what you think it means”

The How

- Target Value Delivery Overview
- Building The Right Team & Culture
- Planning – Breaking the Paradigm
- Defining – Early, Early, Early
- Executing – In Real-Time



Respect for
people | Team



Process
and Flow



Plan | Value
Generation



Collaboration



Continuous
Improvement

IMPORTANT THEMES

- Understanding "Why"
- Communication
- Trust
- Evaluating and Adjusting

Target Value Delivery Overview



Target Value Delivery

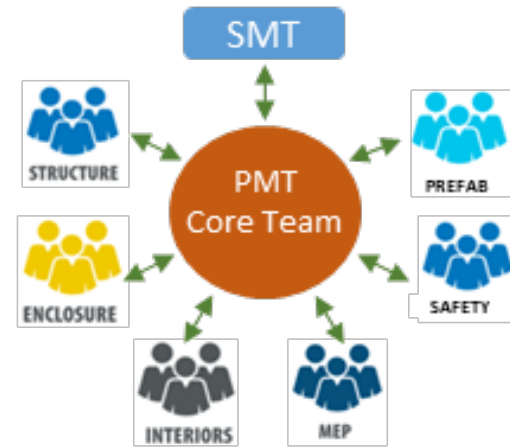


Key Principles of Our Implementation

- Respect and Trust in Relationships are Key to Success
- Maximize Value as Defined By Owner – Eliminate Waste
- Intensive/Earlier Collaboration & Communication
- Increased Planning in Design and Construction
- Continuous Improvement of Processes



Target Value Delivery



SMT - Senior Management Team - Guide
PMT – Project Management Team – Integrate, Decide
Implementation Teams – Initiate, Analyze, Recommend

LEAN TOOLS

- BIG ROOM / CO-LOCATION
- TARGET VALUE DELIVERY
- A3 THINKING
- CHOOSING BY ADVANTAGES
- VISUAL MANAGEMENT
- PULL PLANNING
- LAST PLANNER SYSTEM
- 6S METHODOLOGY

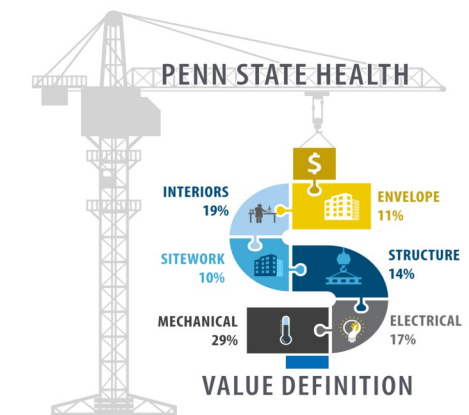
REAL TIME EVALUATION

Cost
Schedule
Constructability
Safety
Operations

Collaborative Planning

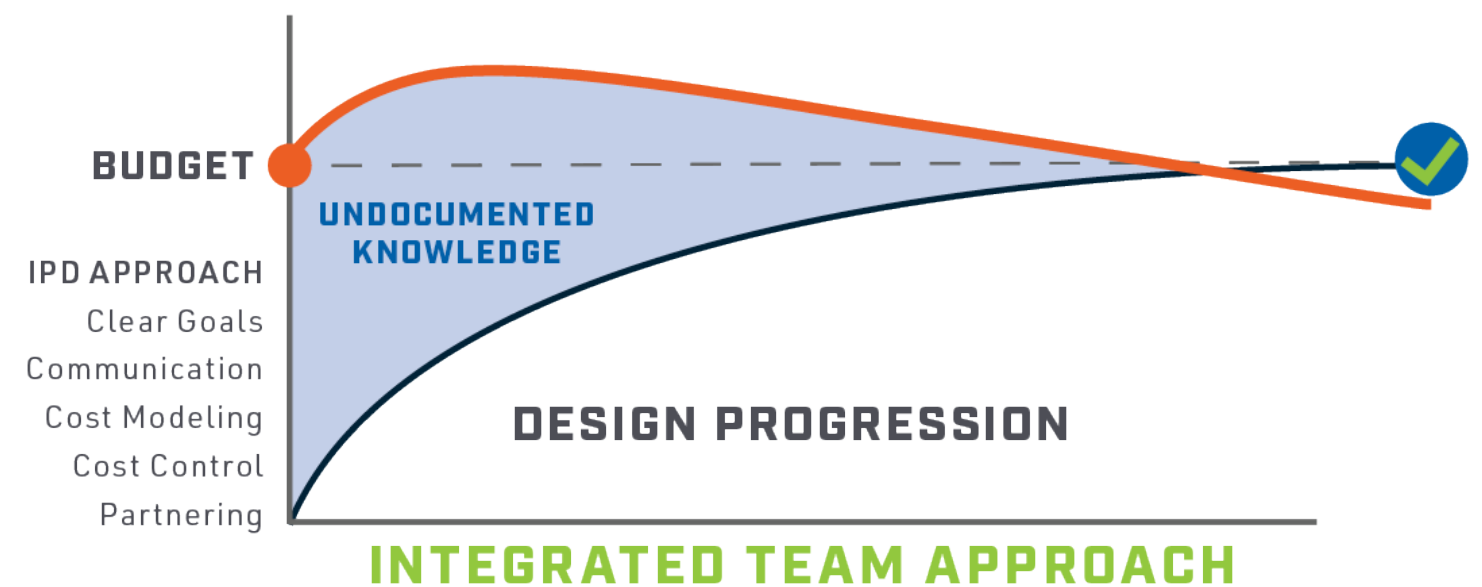


System Target Costs



Key Challenge: BUDGET

With a fast project, how can the team work to **ensure budget consistency**?



Building The Right Team & Culture



Culture Trumps Strategy



KEY THINGS WE DID

- Team Health Monitoring – Survey and open discussion
- Create trusting culture through actions – Owner drives



WHAT WE LEARNED

- Partners felt valued and part of the team
- Developed accountability without demotivation



HOW WE IMPROVED (OR DIDN'T)

- Start Team Health at start of project
- Timely removal of partner if not a fit

Quarterly Survey



What is Going well,
Not Going Well,
Can be Improved?

On-Boarding Trade Partners



KEY THINGS WE DID

- Focus on the people and fit with the culture
- Bring them on as early as possible
- Lose the lawyer - 2 page A3 RFP & Response



WHAT WE LEARNED

- Prioritize: Not all trades were needed day 1
- Not all trades understood LEAN processes and tools



HOW WE IMPROVED (OR DIDN'T)

- Staggered on-boarding per schedule need
- LEAN workshops open to area Subcontractors
- Provide templates for their RFP responses

TRADE PARTNERS AND TIMING TO ON-BOARDING
[FROM CM JOINING THE TEAM]

	CONCRETE	4 MONTHS
	STRUCTURAL STEEL	2 MONTHS
	EXTERIOR METAL STUDS AND AVB*	4-5 MONTHS
	EXTERIOR GLAZING	3 MONTHS
	METAL PANELS*	4-5 MONTHS
	ELEVATORS	3 MONTHS
	MECHANICAL/PLUMBING	3 MONTHS
	BAS CONTROLS	6-7 MONTHS
	ELECTRICAL	3 MONTHS
	PREFABRICATED CENTRAL UTILITY PLANT	3 MONTHS
	PREFABRICATED TOILET ROOMS	3-4 MONTHS

**Depending on complexity and ability to penalize the work, this may or may not be an trade partner.*

Planning – Breaking the Paradigm



Paradigm Shift: Design To Construction



KEY THINGS WE DID

- Milestone Planning at first meeting – Construction then Design
- **Schedule the design plan for construction deliverables**
- Buy-in from team members (not without pushback)



WHAT WE LEARNED

- **Open communication to discuss concerns**
- Schedule and deliverables are constantly changing. Be Flexible
- Deliverables are **continuously developed** (contractual issue)
- **Trust the process** – Understand there will be dynamic tension



HOW WE IMPROVED (OR DIDN'T)

- Spent more time planning the smaller/sub-milestones
- Don't do planning at end of the day - it deserves a fresh brain
- Owners: Onboard the whole team based on TVD process

PSH Lancaster Packages				28-Aug
WEEK/DATE	Type	PACKAGE	CONTENTS	
5-Sep	progress print	RFP PKG SITE, DEEP FOUNDATIONS, STEEL, MEP	Information package only for D.A. subs to provide RFP response.	
30-Sep	LD approval	LAND DEVELOPMENT - Preliminary Plan. Initial Submittal	Site plans both sides of State Road, utilities, grading, roads, building location, Building Elevations NOT required. Showing 36-bed option (max building size)	
14-Oct	Pricing Package	ELEVATOR PRICING	Elevator quantity, location, size/weight, type, machine room type/location. Not final shaft size or interior design or details.	
21-Oct	progress print	CONCRETE PRICE	Locations/types of concrete walls, concrete slabs. Outline information of mass concrete (foundation walls, footings). Not final pricing package, not rebar, only initial information to start D.A. sub on pricing.	
28-Oct	progress print	RFP CONCRETE	BMA to issue RFP for conc based on progress package. Not final pricing. Not deliverable by design team.	
28-Oct	LD approval	LAND DEVELOPMENT - Preliminary Plan, Formal Submittal	Site plans both sides of State Road, utilities, grading, roads, building location, Building Elevations NOT required.	
1-Nov	LD approval	LAND DEVELOPMENT - Final Plan. Initial Submittal	Only Hospital Site. HKS team to send design info to Rettew. Info regarding ground plane and site utilities, building footprint, exits. Building Elevations NOT required.	
4-Nov	Bid Package	GARAGE BRIDGING DOCUMENTS	Deliverable for garage design-builder bids.	
14-Nov	LD approval	LAND DEVELOPMENT - Final Plan. Initial Submittal	Only Hospital Site. HKS team to send design info to Rettew. Info regarding ground plane and site utilities, building footprint, exits. Building Elevations NOT required.	
25-Nov	Pricing Package	STEEL MILL ORDER	Struc grids, sizes of columns, girders, main beams ONLY. Not edge of slab, not shafts, not misc steel framing.	
16-Dec	progress print	DEEP FOUNDATIONS - Preliminary Info	Foundation info - locations, type (caissons, rigid inclusions). Not final	
23-Dec				ation,
6-Jan				ion oards.
13-Jan				
20-Jan				
20-Jan				ns
20-Jan				ng not
10-Feb				
2-Mar				
30-Mar				
11-May				
13-Jul				

Defining – Early, Early, Early



Scope Definition



KEY THINGS WE DID

- Matrices, early scope discussions
 - Review primary cost drivers first
- Early sketches to provide clarity



WHAT WE LEARNED

- Ensure talking the same language
- All in the room – can solve quickly
- Include Client in every discussion



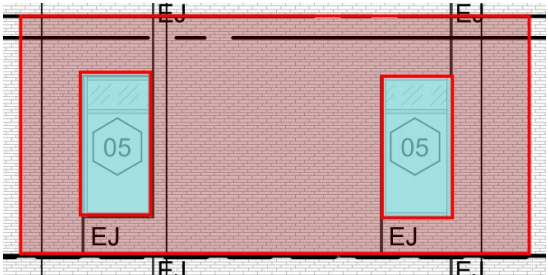
HOW WE IMPROVED (OR DIDN'T)

- Trades assembled pre-submittals early
- Learned each other's language – mostly

Plan / Specify /						Drawings		Purchase	Delivery/Placeme		Installation	
Architect / Engineer	Equipment Consultant	Furniture Consultant	Sign Consultant	Kitchen Consultant	Owner, Facilities Group	Owner, IT Group	A/E Full Design	A/E Rough-in Only	int	mt	sup	in
PENN STATE HAMPDEN MEDICAL CENTER												
McCLURE CO. JOB NO. 22976												
PLUMBING PIPING MATERIALS SUBMITTAL												
SYSTEM NAME		SPEC. SECTION		PIPE		FITTINGS		FLA				
				2" & UNDER	2 1/2" & OVER	2" & UNDER	2 1/2" & OVER	2" & UNDER	2 1/2" & OVER			
DOMESTIC WATER		221116		P2		P2 NOTE 6		F4		F4 NOTE 6		
DOMESTIC WATER		221116				P6 NOTE 7				F8 NOTE 7		
PURE WATER SYSTEM		NO SPEC		P7 NOTE 5				F9 NOTE 5				
GREASE WASTE-U/G		221316		P5		P5		F10		F10		
SANITARY WASTE VENT-A/G		221316		P4		P4		F7 NOTE 4		F7 NOTE 4		
SANITARY WASTE RISERS - A/G		221316		P5		P5		F10		F10		
SANITARY WASTE RUNS - A/G		221316		P5		P5		F10		F10		
STORM DRAINS (ST/SST)- A/G		221316		P5		P5		F10		F10		
NATURAL GAS		226100		P1		P1		F2 OR F1		F2 OR F1		
COMPRESSED AIR		226113		P3 NOTE 3		P3 NOTE 3		F5 NOTE 3		F5 NOTE 3		
MEDICAL AIR		226213		P3		P3		F5		F5		
MEDICAL VACUUM		226213		P3		P3		F5		F5		
MEDICAL VACUUM EXHAUST		226213		P3		P3		F5		F5		
MEDICAL GAS		226313		P3		P3		F5		F5		
MEDICAL OXYGEN - U/G		226313		P3		P3		F5		F5		

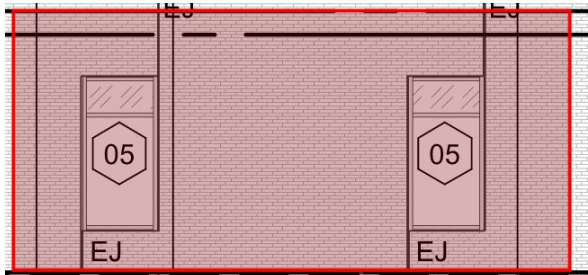
PIPE:
P1: ASTM A-53/A-106 GR.B SCH. 40/STD TYPE E OR S, C.S.
P2: ASTM B88 TYPE L HARD DRAWN COPPER
P3: ASTM B 819 TYPE L HARD DRAWN COPPER C.N.C
P4: ASTM A888 CAST IRON NO HIR SERVICE WT.

FITTINGS:
F1: ASTM A 234 WROUGHT STEEL WELDING FITTINGS
F2: ASME B16.3 CLASS 150 M.J.
F4: VIEGA PRO PRESS
F5: ASTM B819 COPPER C.N.R.



CM Take-off

500sf @ \$30/sf
\$15,000



Mason Take-off

600sf @ \$30/sf
\$18,000

Budget and Target Development

Managing Risk

- Understand what is **known** and what level of detail at that time of cost model.
- Some things we know will come later (**known unknowns**)
- Some things will be surprises (**unknown unknowns**)
- Dealing with risk and surprises
 - > Address right away, record on Cost Control Log
 - > Define parameters
 - > Assign responsibility and schedule to resolve
 - > Actively manage design contingencies by PIT

Description	Quantity	CWE / SF	Current Direct Cost (CDC)	Escalation	Design Contingency
CONSTRUCTION COST					
HOSPITAL					
Structure	144,329	0.277	\$73,811	\$24,470,243	\$342,444
Building Enclosure (incl Helipad/Canopies)	144,329	0.277	\$8,134	\$1,947,102	\$217,377
Interiors	144,329	0.277	\$104,031	\$34,111,742	\$450,155
Mechanical/Plumbing/Fire Protection	144,329	0.277	\$134,731	\$43,471,150	\$570,457
Electrical (incl Main Gear)	144,329	0.277	\$67,472	\$22,107,814	\$297,126
Central Utility Plant	8,410	0.277	\$1,875,472	\$1,155,300	\$154,575
TOTAL HOSPITAL	152,739	0.277	\$245,117	\$1,155,300	\$2,107,430
MOB					
Structure	43,000	0.277	\$11,814	\$2,015,502	\$271,335
Building Enclosure	43,000	0.277	\$1,018	\$1,405,531	\$194,155
Interiors	43,000	0.277	\$1,118	\$3,024,473	\$407,740
Mechanical/Plumbing/Fire Protection	43,000	0.277	\$1,118	\$2,493,500	\$334,515
Electrical	43,000	0.277	\$1,118	\$2,154,500	\$287,544
TOTAL MOB	43,000	0.277	\$3,268	\$12,113,500	\$1,695,289
GARAGE					
SITEWORK					
TOTAL DIRECT COST				\$20,270,430	\$3,417,430
INDIRECT COST					
PMT Contingency				\$212,242,000	
Construction Contingency	OF				
Preconstruction Phase Services (NA)				\$214,123,000	
CM Staff Cost	OF				
GRs (Site Office, Site Reg'ts, Cleaning, Safety, et	OF				
Permits	US				
CCIP Insurance (CM + Trade GL&WC)	OF				
Harrisburg City Privilege Tax					
CM Payment and Performance Bond					
Base CM Fee	OF				
TOTAL INDIRECT COST					

Budget and Target Development



KEY THINGS WE DID

- Consistent and ongoing quantity takeoffs
- Agreement on definitions, working methods, goals, what is included in what system
- Concept estimate in 2 weeks based on Benchmarks



WHAT WE LEARNED

- Set targets on where you want to spend your dollars
- Why do we need it conversation vs do we really need it
- More communication between the estimator and designer yields results.

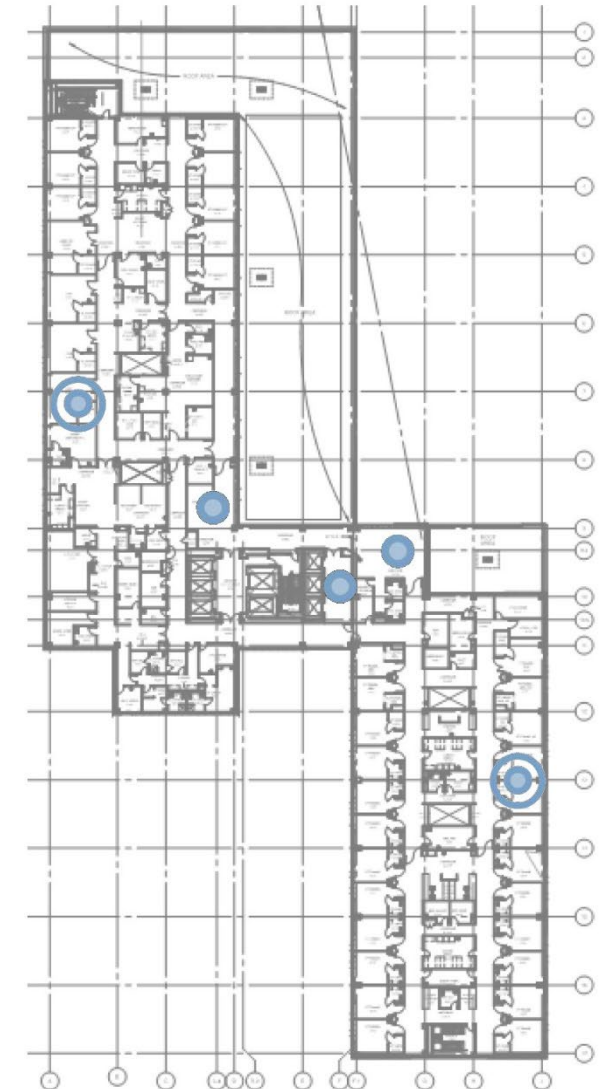


HOW WE IMPROVED (OR DIDN'T)

- Spent more time on target development (2mo) and 1st full estimate (4mo)
- Challenging the team can lead to great results – (LMC targets 7% less than HMC)
- Develop a roadmap for each system – exterior, structure, equipment, MEP

 Main Touchpoints

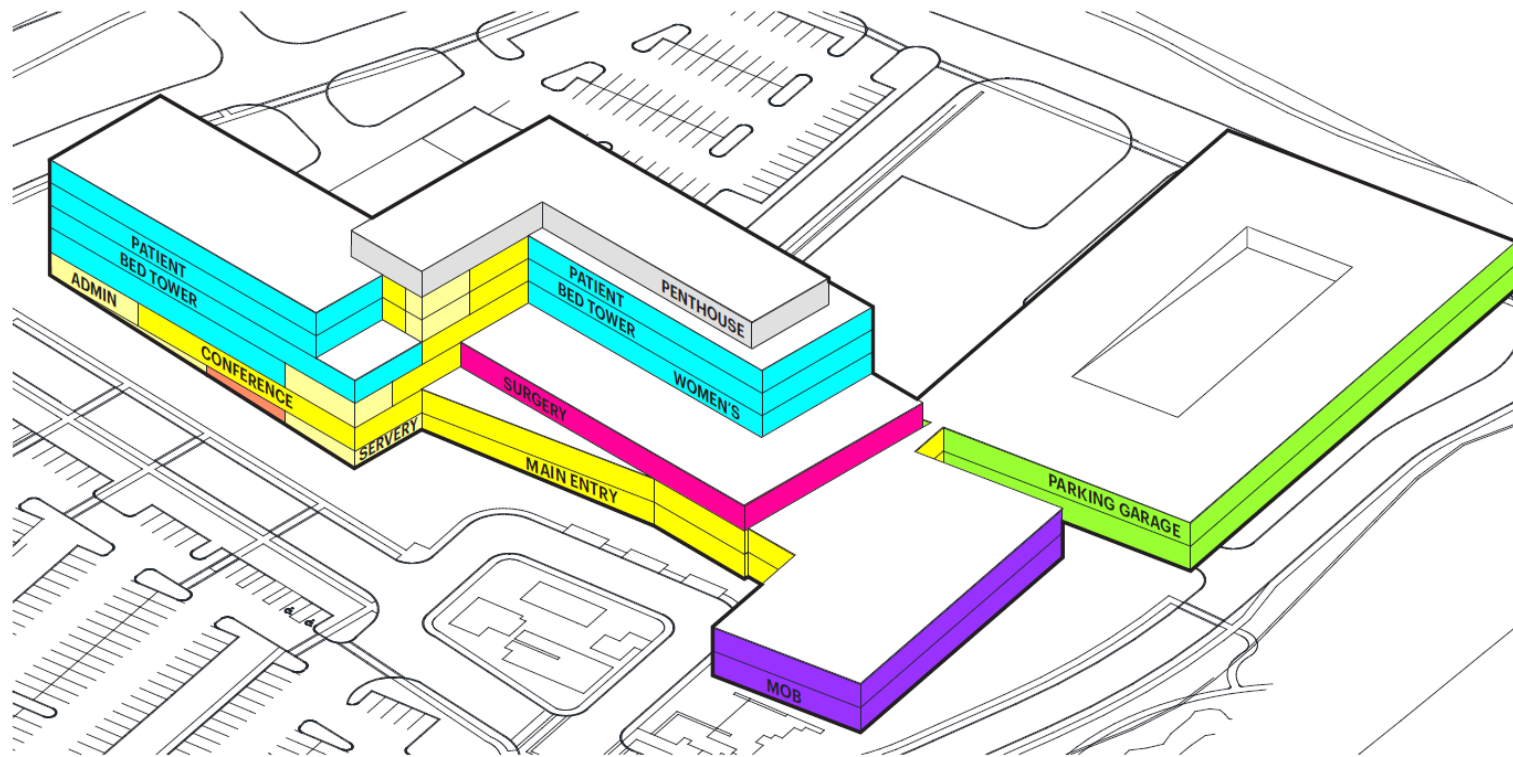
 Secondary Touchpoints



Budget and Target Development

EXAMPLE: Exterior Wall

- At Massing/Program, we established targets and agreed on unit cost



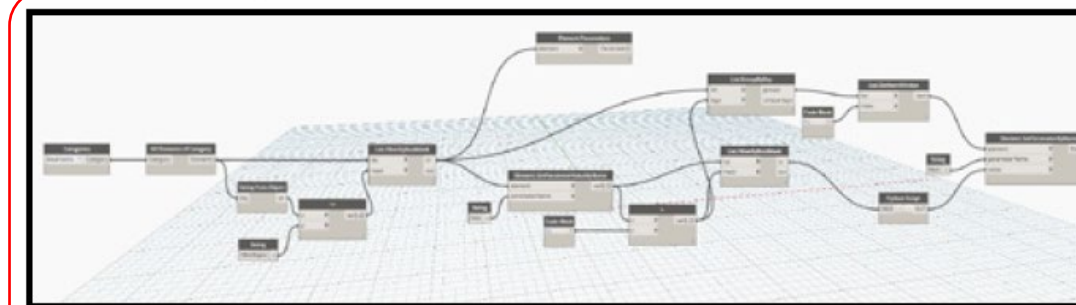
Building Massing - Programmatic Diagram

Exterior Wall Area (above grade)	Estimated Areas	% total	HKS includes these for our budget test to confirm our meeting budget targets		
			Assumed cost	Assumed cost	cc
Total	143,925			\$ 12,050,000.00	\$
Window Wall glass/spandrel	4,200	2.9%	\$ 95.00	\$ 399,000.00	
Curtain Wall glass/spandrel	43,000	29.9%	\$ 125.00	\$ 5,375,000.00	
Brick A (lighter brick at upper levels)	47,500	33.0%	\$ 60.00	\$ 2,850,000.00	
Brick B (darker brick at lower levels)	30,700	21.3%	\$ 60.00	\$ 1,842,000.00	
Panel system	6,900	4.8%	\$ 85.00	\$ 586,500.00	
Louvers	1,500	1.0%	\$ 125.00	\$ 187,500.00	
Party wall between hospital and MOB (level 1 + 2), 125LF x 25'h	3,125	2%	\$ 80.00	\$ 250,000.00	
Stair / PH Enclosure					
Elevators, 1500 sf, 250LF x 20'h	5,000	3.5%	\$ 80.00	\$ 400,000.00	
Elevator Over-run, 75LF x 20'	2,000	1.4%	\$ 80.00	\$ 160,000.00	
Screen wall, 550LF x 10'h	5,500		\$ 75.00	\$ 412,500.00	
Canopies (cladding only, struc carried in struc)					
Main entry canopy	4,500		\$ 80.00	\$ 360,000.00	
ED drop off canopy	2,800		\$ 80.00	\$ 224,000.00	
Ambulance drop off canopy	800		\$ 65.00	\$ 52,000.00	
Loading Dock canopy (12' w)	1,100		\$ 65.00	\$ 71,500.00	
			Total for Canopies =		\$ 707,500.00

Budget and Target Development

EXAMPLE: Exterior Wall

- Continuous measuring.
- New macro in Revit for faster take offs by Architect
- Keep design on target.
- Review unit costs with subs



Properties

Filled region
AREA_BRICK-B_MAGENTA_ME

Detail Items (1)

Text

Elevation **WEST**

Dimensions

Area 9303.18 SF

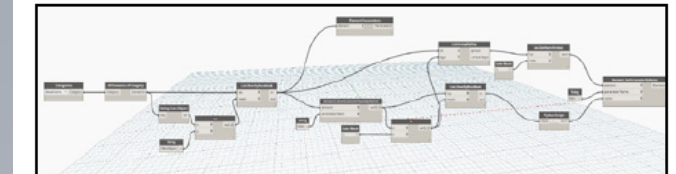
Identity Data

Image

FILLED REGION SCHEDULE (MATER...

<FILLED REGION SCHEDULE (MATERIAL TAKE-OFFS)>

A	B	C	D
Material	Area	Cost	Elevation
BRICK A	3493	60.00	SOUTH
BRICK A	6656	60.00	SOUTH
BRICK A	8542	60.00	NORTH
BRICK A	13793	60.00	EAST
BRICK A	14793	60.00	WEST
BRICK B	1083	60.00	WEST
BRICK B	2800	60.00	SOUTH
BRICK B	5444	60.00	NORTH



Properties

Filled region
AREA_BRICK-B_MAGENTA_ME

Detail Items (1)

Text

Elevation **WEST**

Dimensions

Area 9303.18 SF

Identity Data

Image

Comments **BRICK B**

Mark **9303**

Workset View "Elevation: West, W..."

Edited by medwards@hinc.com

FILLED REGION SCHEDULE (MATER...

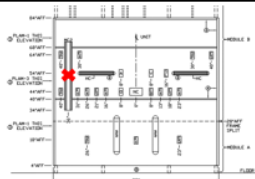
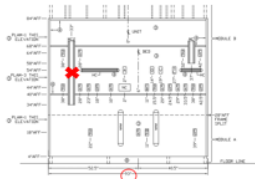

<FILLED REGION SCHEDULE (MATERIAL TAKE-OFFS)>

A	B	C	D
Material	Area	Cost	Elevation
BRICK A	3493	60.00	SOUTH
BRICK A	6656	60.00	SOUTH
BRICK A	8542	60.00	NORTH
BRICK A	13793	60.00	EAST
BRICK A	14793	60.00	WEST
BRICK B	1083	60.00	WEST
BRICK B	2800	60.00	SOUTH
BRICK B	5444	60.00	NORTH
BRICK B	9303	60.00	WEST
BRICK B	1083	60.00	EAST
COMPOSITE PANEL	1103	85.00	WEST
COMPOSITE PANEL	2800	85.00	SOUTH
COMPOSITE PANEL	5444	85.00	NORTH
COMPOSITE PANEL	9678	85.00	WEST
COMPOSITE PANEL	10846	85.00	EAST
CURTAIN WALL	4237	125.00	SOUTH
CURTAIN WALL	7863	125.00	NORTH
CURTAIN WALL	12889	125.00	WEST
CURTAIN WALL	18420	125.00	EAST
METAL PANEL	602	60.00	NORTH
METAL PANEL	1006	60.00	SOUTH
METAL PANEL	2084	60.00	EAST
METAL PANEL	2643	60.00	WEST
PENTHOUSE MATERIAL	1888	60.00	SOUTH
PENTHOUSE MATERIAL	1567	60.00	NORTH
PENTHOUSE MATERIAL	2791	60.00	SOUTH
PENTHOUSE MATERIAL	3330	60.00	WEST
PENTHOUSE MATERIAL	4852	60.00	EAST
WINDOW WALL	703	95.00	NORTH
WINDOW WALL	803	95.00	EAST
WINDOW WALL	1113	95.00	SOUTH
WINDOW WALL	1080	95.00	WEST

Budget and Target Development

EXAMPLE: Headwalls / Utilities

- During SD
- Learn from Past (last project had late cost increases due to circuiting)
- Establish Targets (what is needed? Where is the cost?)
- Define before we draw
- Matrix compare FGI, Past Project, Current Project

PSH LANCASTER							
Clinical Room Utility Analysis							
Prefab Headwall							
Lancaster Type	Hampden Image		Hampden utilities- amount of		FGI minimum-amount required		RECOMMENDATION
			Individual Room Quantities	Unit Electrical Branch Circuit Quantities (includes additional receptacles required for equipment and	Individual Room Quantities	Unit Electrical Branch Circuit Quantities (includes additional receptacles required for equipment and	Lancaster Direction
TYPE A- ED Triage/Recliners		Electrical/Data	Headwall: 4-Duplex Normal 6-Duplex Emergency 4-Data Balance of Room: 5-Duplex Normal 1-Duplex Emergency Circuits: Unknown based on fit-out drawings received, assumed a rule 2 ded	Normal - 175 circuits Emergency - 250 circuits Note: quantities indicated are for the entire ED.	6 Min Headwall Total: 1-Duplex Normal 2-Duplex Emergency Circuits: 1-Normal (shared between rooms acceptable) 1-Emergency (shared between rooms acceptable)	Normal - 120 circuits Emergency - 190 circuits Note: quantities indicated are for the entire ED.	Per Hampden EXCEPT: Delete MC2 monitor channel and associated power and data outlet. These move to partition
		Med Gas	1-D2 1-MA 1-V and slide		1-D2 0-MA 1-V and slide		Per Hampden (Beyond Code)
TYPE B- ED Exams, OBS, All		Electrical/Data	Headwall: 5-Duplex Normal 8-Duplex Emergency 6-Data Balance of Room: 5-Duplex Normal 1-Duplex Emergency Circuits: 2-Ded. Normal 2-Ded. Emergency 1-Emergency (shared between 4 rooms)		12 Min Headwall Total: ____ 3-Duplex Normal 3-Duplex Emergency Circuits: 1-Normal (shared between rooms acceptable) 1-Emergency (shared between rooms acceptable)		NO CHANGE TO QUANTITY OF RECEPTACLES 1DEDICATED EMERGENCY CIRCUIT PER EXAM ROOM 1DEDICATED NORMAL CIRCUIT PER EXAM ROOM
		Med Gas	1-D2 1-MA 1-V and slide		1-D2 0-MA 1-V and slide		Per Hampden (Beyond Code)
TYPE B-1- ED BH Exam			Headwall: 5-Duplex Normal 7-Duplex Emergency 6-Data Balance of Room (based on Treatment Specialty): 5-Duplex Normal Circuits: 1-Ded. Normal 1-Ded. Emergency		0 receptacles required If utilized for non-BH patients: 12 Min Head Total Circuits (non-BH): 1-Normal (shared between rooms acceptable) 1-Emergency (shared between rooms acceptable)		

Budget and Target Development

EXAMPLE: Headwalls / Utilities

- Result: circuiting is defined
- Fewer variations for prefab

PSH LANCASTER		Clinical Room Utility Analysis								Patient Room		Patient Room	
Prefab Headwall										7-Duplex Normal		7-Duplex Normal	
Lancaster Type	Hampden Image	Hampden utilities- amount of		FGI minimum-amount required						1-Duplex Emergency Circuits: 3- Ded. Normal 2- Ded. Emergency 1- Emergency (shared between 4 rooms)		4-Duplex Emergency (crit A/B) Circuits: 1-Ded. Normal (or crit A/B) 1- Ded. Emergency (or crit A/B)	
		Individual Room Quantities	Unit Electrical Branch Circuit Quantities (includes additional receptacles required for equipment and function of each space and support areas in each department)	Individual Room Quantities	Unit Electrical Branch Circuit Quantities (includes additional receptacles required for equipment and function of each space and support areas in each department)								
TYPE H1/H2- ICU		Headwall: 3-Duplex Normal 8-Duplex Emergency 3-Data Balance of Room: 7-Duplex Normal 1-Duplex Emergency Circuits: 3- Ded. Normal 2- Ded. Emergency 1- Emergency (shared between 4 rooms)	Normal - 120 circuits Emergency - 140 circuits Note: 24-bed unit. Dialysis machine does not have a dedicated circuit in each patient room.	16 Min Headwall Total with one on each wall: 3-Duplex Normal (on perimeter walls) 4-Duplex Normal (or crit A/B) 4-Duplex Emergency (crit A/B) Circuits: 1-Ded. Normal (or crit A/B) 1-Ded. Emergency (or crit A/B) 1-Normal (shared between 2-3 rooms)	Normal - 60 circuits Emergency - 135 circuits Note: 24-bed unit. Dialysis machine does not have a dedicated circuit in each patient room.	NO CRIT A + B AT HEADWALL. (ONLY CRITICAL CIRCUITS AT HEADWALL, NOT NORMAL.) 3 DEDICATED CIRCUITS FOR ROOM 1 SHARED BETWEEN 3 ROOMS FINAL REVIEW WITH EQUIPMENT REQUIRED (VENTILATORS, DIALYSIS, ETC. FOR DEDICATED CIRCUITS)							
		Electrical								Per Hampden and FGI			
		Med Gas	3-O2 1-MA 3-Vacuum/ slide	3-O2 1-MA 3-Vacuum/ slide						Per Hampden EXCEPT: Delete Dialysis box			

Executing in Real-Time



Organizing for Success



KEY THINGS WE DID

- Have processes defined early – File sharing, decision making/makers
- Thoroughly documented discussions, decisions, impacts
- Cost Control Logs (CCL) to record decisions
- A3's to assist in decisions.



WHAT WE LEARNED











- One location for documentation - accessible to all
- Reinforce the use of a single site.
- Getting decisions requires proper information



HOW WE IMPROVED (OR DIDN'T)

- Remind of the file structure periodically

All Files > ... > PSHL-X > PSHL-X.OAC > ★ PSHL-X.OACDA

Name ^		Updated	Size
 00 Project Ops Manual		Apr 23, 2020 by John Horn	5 Files
 05 Team Governance	 	Aug 27, 2020 by Emily Spis...	15 Files
 09 Scope Responsibility Matrix	 	Aug 7, 2020 by Roger Stadler	6 Files
 10 Budget		Aug 31, 2020 by Roger Stad...	297 Files

Hampden Medical Center

BACKGROUND

- Explore alternatives safety and lighting design on IMC/ICU Nurse Stations

GOAL

- Determine most cost effective means of achieving the visual wayfinding of the nurse stations.

BASE DESIGN

CHAMPION
Amee Platt

COLLABORATORS
Steve Nizcoro, Matt Oude

TITLE
A3--Topic 003

IMPACT TO BUDGET
FIR in Budget Reduction

IMPACT TO SCHEDULE
None

DATE
2019-06-11

SIGNATURE APPROVAL

BUDGET

- OPTION 1: SAVINGS (15,437)
- OPTION 2: SAVINGS (29,189)

CONCLUSION

- DO NOT INCORPORATE ANY OF THE REVISIONS, HOLD AS POTENTIAL ALTERNATE B IF NEEDED TO ACHIEVE BUDGET.

Lancaster Medical Center

BACKGROUND

The team needed to review and decide on the best deep foundations system to move forward with for our four major structures (Hospital, MOB, Garage & CLUP).

Problem Statement

Determine the suitability of Rigid Inclusions and Micropiles the project site conditions.

Analysis

CHAMPION
Joeth Wingenfeld

COLLABORATORS
Todd Hildebrand, Jessica Rose, Kelle Jacob, Todd Perle

TITLE
Deep Foundations

IMPACT TO BUDGET
Setting Budget

IMPACT TO SCHEDULE
Minimal

DATE
2019-11-18

SIGNATURE APPROVAL

Analysis (Cont)

	Micropiles	Rigid Inclusions
Constructability	Greater concern with ground water cutting up during the installation (specifically around the garage)	Concerns with ground water (but less than micropiles)
Constructor Input	Positive feedback from contractors for use of micropiles on this site.	Some contractors that do both micropiles & RIs have expressed concerns with RIs on this site.
CBA Total	CBA Value: 18	CBA Value: 129

Communication



KEY THINGS WE DID

- Colocation facility, Big Room Utilization (In person twice/month for 2 days)
- Direct lines of communication – no funnels that become roadblocks
- Establish the stakeholders and timing required for all decisions
- Owner was present at most meetings to provide real-time direction/decisions



WHAT WE LEARNED

- Needed more work-time between Big Room meetings to work
- Needed more continuity across the teams to ensure coordination



HOW WE IMPROVED (OR DIDN'T)

- Big Room once/month, scheduled calls for off-weeks,
- Need someone from Contractor and Architect that attends majority of meetings
- Each meeting needs someone to drive the team to decisions - Assign an ELMO!



Enough! Lets move on!

Real-Time Review/Continuous Estimating



KEY THINGS WE DID

- Estimate options as discussed, track decisions when made
- 'Target' allowances get tracked – **only accepted when solved**
- CM: 3-4 Estimators for trades without Partners – Spread work load



WHAT WE LEARNED

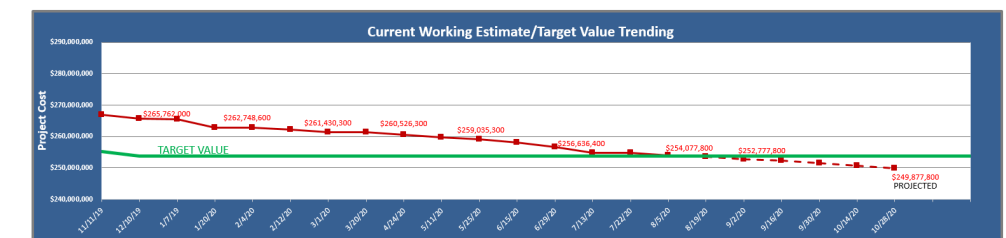
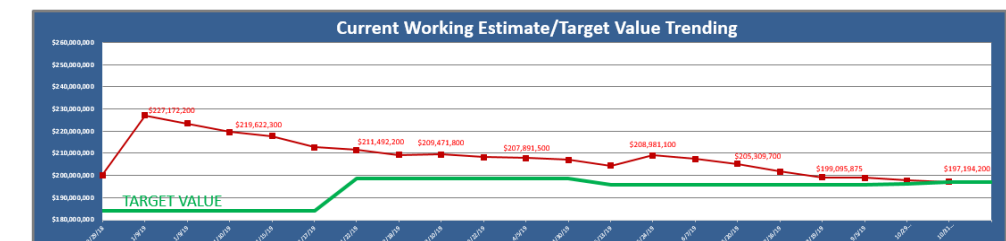
- Utilize rough, order of magnitude estimates to narrow possible solutions - Save Time!
- Culture - allow making decisions on imperfect information



HOW WE IMPROVED (OR DIDN'T)

- One estimator on site, structure, enclosure, one on Interiors
- Reconciling Owner approvals (one set of docs) with the speed of delivery requirements was difficult

Description	Current Working Estimate (CWE)	Delta (CWE-TVD)	Delta % of CDC
CONSTRUCTION COST			
HOSPITAL			
Structure	\$22,887,000	\$22,887,000	-1.2%
Building Enclosure (incl Helipad/Canopies)	\$18,287,188	\$18,287,188	-9.6%
Interiors	\$25,242,738	\$25,242,738	1.0%
Mechanical/Plumbing/Fire Protection	\$27,888,200	\$27,888,200	3.1%
Electrical (incl Main Gear)	\$22,458,300	\$22,458,300	3.1%
Central Utility Plant	\$12,888,841	\$12,888,841	-2.9%
TOTAL HOSPITAL	\$149,262,166	\$149,262,166	0.4%
MOB			
Structure	\$1,888,700	\$1,888,700	3.5%
Building Enclosure	\$3,000,700	\$3,000,700	6.0%



Recap



How can you apply this tomorrow?



Establish clear lines of communication, clear deliverables, and schedule.



Establish targets and metrics early, but don't cut too close to the bone (allow for development of design).



This isn't a traditional feedback loop. Communication should be nearly constant for most effective work.



Don't underestimate the importance of organizing how the team will share and document information



How can you apply this tomorrow?



Select the right partners, not just the 'cheap' ones. You will need experienced people who can be flexible and know their business.



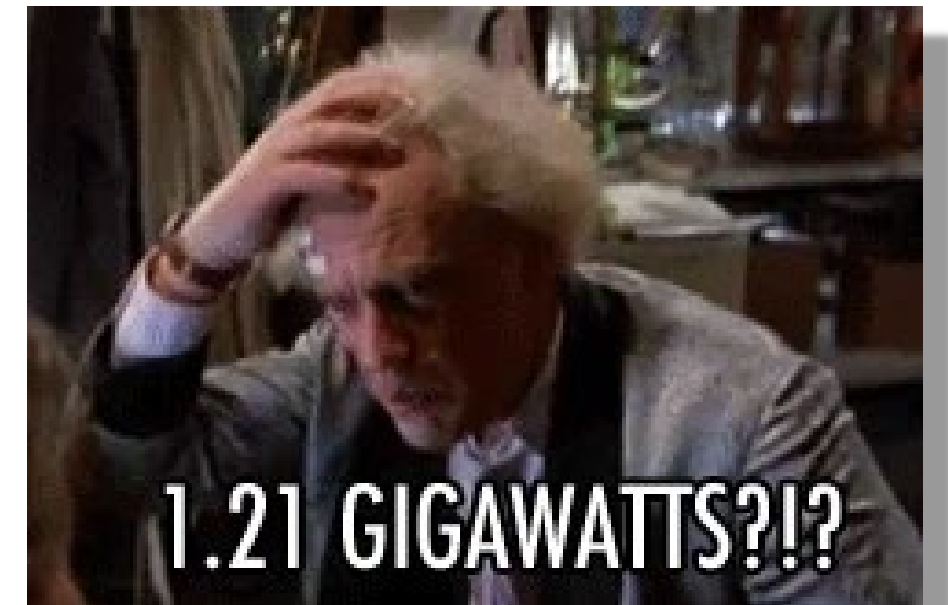
Don't underestimate the value and impact of culture on the process Don't be afraid to remove toxic partners.



Owner makes the investment in preconstruction process and gets the ROI - minimizing change orders, RFI's. Distractions are minimized



**Be uncomfortable. Trust the team. Trust the process.
Don't retreat to old behaviors when facing challenges**





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Thank you for attending this presentation. Enjoy the rest of the 22nd Annual LCI Congress!